

BRIEF COMMUNICATION

COMMENT: PRELIMINARY INVESTIGATIONS OF BEACH RIDGE PROGRADATION ON EYRE PENINSULA AND KANGAROO ISLAND

In the course of discussion of beach ridges on Eyre Peninsula and Kangaroo Island, brief mention is made of shore platforms and their implications for sealevel change. Two statements based on earlier reports^{7,8} concerning shore platforms are questionable. (p.62; p.56).

The first is that all of the shore platforms examined on the west coast of Eyre Peninsula possess "a single active platform surface" (p.56). We take issue because the impression conveyed is that only one platform is developed within rocky shore profiles. As recorded earlier⁴ flights of platforms are commonly developed within the tidal zone. They are typically separated by low cliffs a few tens of centimetres high. In addition platforms of limited areal extent occur near or above high tide and even storm tide level, and some stand even higher, though all are located within the spray zone. The situation described from parts of Kangaroo Island¹² is commonplace also on the west coast of Eyre Peninsula.

Second, in the 1956 report⁷ it is stated that at Pennington Bay "a Pleistocene platform is fronted by two Holocene platforms at different elevations . . . The upper platform . . . lies 50 cm above the lower platform . . . The difference in elevation . . . may be the result of a slight fall of sea-level (50 cm) producing a lowering of the level of saturation and hence platform erosion". The site is illustrated (p. 59) and it is suggested that the highest platform "most likely represents the 120,000 yrs BP Pleistocene sea-level", that the intermediate platform, standing 2.5 m below the "Pleistocene" feature is of early Holocene age, and that only the (lowest, 50 cm below the intermediate form, is presently active.

We find the suggestion that each platform relates to a distinct and separate sealevel surprising. Some years ago the same interpretation was proposed in explanation of platforms and other alleged coastal features in the Adelaide area and on Yorke Peninsula.^{3,9} It was then claimed that stands of the sea differing by as little as 42.16 cm could be distinguished on the basis of a range of forms and deposits collectively described as "former coastal features"¹⁰ (p.291). These conclusions were challenged at the time⁷ partly on the grounds that the Gulf's region of South Australia is, and long has been, tectonically active, rendering present elevations an insecure basis for correlation or dating (a tilt of as little as 1" implies a vertical difference of some 18m/km); partly because the central Mediterranean region that provided the basis for dating and correlation was even then known to be and has been tectonically unstable, so that correlation on elevation alone was invalid;¹¹ partly because some of the stratigraphic evidence was suspect.

More fundamentally other workers^{9,11} had earlier pointed to evidence strongly suggesting that processes additional to wave attack were active in platform development, and that the flights of platforms they had observed on the coasts of NSW and Victoria had developed simultaneously and in relation to the one present sealevel. Our observations on many parts of the South Australian coast have led us to similar conclusions, though structure and the etch factor complicate the profiles

developed on many rocky shores. Thus the platforms in granite and gneiss exposed around Point Brown, on the Westall Peninsula and at Point Drummond for instance are etch forms.^{4,11,12} Separating out such complications however there is clear indication that pool weathering^{10,13,14,15} contributes to platform development not only in the tidal range but also above it, within the spray zone; and that though pronounced on calcarenite coasts, its effects are not limited to that lithological setting. For example, the serrated platform at Hallett Cove, just south of Adelaide is developed on folded siltstone. The platform is an entity, but included within the whole are several flats each a few metres square that vary in elevation by up to one metre. They are unlikely to reflect lithological contrasts as they occur along strike, and they cannot be due to wave abrasion as many are protected to seaward by minor strike ridges. Some of the flats formed at or near high and storm tide levels are quite extensive,⁴ but those within the spray zone are small, though distinct. Thus spray pool generated flats a few metres diameter stand about 8 m above the high tide level at Wellesey Point, near Elliston. Developed in calcarenite, the pool floors are remarkably flat. They commonly carry seawater (and rainwater after falls) and small shells, and the sidewalls are to a greater or lesser degree overhanging as a result of the dissolution of the calcarenite by standing waters. Such pool floors gradually extend laterally and eventually coalesce with one another to form a platform that includes flats at slightly different elevations.

For these reasons we suggest platforms are related to sealevel only in a general way. Each platform does not necessarily represent a distinct and separate sealevel.^{16,17} Flights of platforms do not necessarily imply changes of sealevel. That flights with similar components and vertical separation occur at different sites along the coast may merely imply that similar sets of processes are at work on each.

We accept that some of the platforms preserved on the coast of Eyre Peninsula are demonstrably of Pleistocene age. For instance that described from Point Collison³ (p.136) is clearly of the order of 40,000 years old. But others, even those of similar elevation with respect to present sealevel, cannot be correlated automatically and dated by comparison with such dated sites: The high platform at Pennington Bay for instance is still within range of high and storm tides, and is certainly touched by spray. The cusps developed in the low cliff to seaward of the platform⁷ (p. 59, Fig. 4.15) surely prove scouring and solution by seawater at the present time, and the shingle located at the base of the backing cliff may also be related to high and storm tides.

We found nothing to disprove the suggestion that flights of platforms are being formed simultaneously in relation to modern sealevel. Jutson, Hill and many others would be astonished at the suggestion that each and every shore platform is related to a separate and distinct sealevel and that shore platforms can be correlated and even dated on the basis of their elevation. On the other hand, we agree wholeheartedly with the conclusion that "shore platforms are highly questionable indicators of sea-level" (p. 156)

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- ¹⁷Russell, R. J. (1963) *Science* 139 (35490) 9-15.

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